App. No. 09/560,269
Amendment dated February 13, 2007
Reply to Office Action of November 13, 2006

REMARKS

Claims 1, 5, 7-16, 20, 22-31, 35 and 37-45 remain in this application for further review. Claims 1, 5, 12, 13, 16, 27, 31, 35, 42 and 43 have been amended. No new matter has been added.

I.   Examiner Interview

Applicants held an Examiner Interview with Examiner Rutten on 1/17/07. During the interview Examiner Rutten requested that the claims be clarified to pertain to tail merge. Examiner Rutten has also asked applicants to comment on the "scope" teaching in Angel. Examiner Rutten further requested that applicants clarify a point under 35 U.S.C. 112. Applicants have made changes accordingly. Even though a formal agreement as to allowability was not reached, applicants believe that an agreement was reached that the changes move prosecution forward over the cited references.

II.   Objections to the Drawings

The drawings are objected to under 37 CFR 1.83(a) as not showing every feature of the invention specified in the claims. The Office Action states that the "internal called function" (e.g. claim 16 lines 17-18) and the "external called function" (e.g. claim 16 line 18) must be shown or the features canceled from the claims. Applicants respectfully traverse.

The specification discusses calls within the current module as well as calls outside of the current module at, for example, page 10 lines 9-24. The specification states that "while instrumentation of calls within the current module can be eliminated from the list of instrumentation points, instrumentation calls outside of the current module cannot" in relation to FIGURE 3. (Specification, at pg. 10, lines 13-15). The specification goes on to state "[t]hus, as a general rule, calls outside the current module are instrumented before and after the call is performed, e.g., if the main function 314 and the function 316 were located in different modules, _CallToFunction and _ReturnFromFunction probes would be inserted at locations 304 and 306, respectively." Therefore, the main function 314 and the function 316 provide examples of

App. No. 09/560,269
Amendment dated February 13, 2007
Reply to Office Action of November 13, 2006

functions that may be the "internal called function" and the "external called function" of the claims. Accordingly, applicants respectfully request withdrawal of the objection.

III.   Objections to the Specification

The specification is objected to under 37 CFR 1.75(d)(1) as failing to provide proper antecedent basis for the claimed subject matter. The Office Action states that there is no discussion in the specification regarding "internal" or "external" called functions as claimed. Applicants respectfully traverse.

The specification discusses calls within the current module as well as calls outside of the current module at, for example, page 10 lines 9-24. The specification states that "while instrumentation of calls within the current module can be eliminated from the list of instrumentation points, instrumentation calls outside of the current module cannot" in relation to FIGURE 3. (Specification, at pg. 10, lines 13-15). The specification goes on to state "[t]hus, as a general rule, calls outside the current module are instrumented before and after the call is performed, e.g., if the main function 314 and the function 316 were located in different modules, _CallToFunction and _ReturnFromFunction probes would be inserted at locations 304 and 306, respectively." Therefore, the main function 314 and the function 316 provide examples of function that may be the "internal called function" and the "external called function" of the claims. Accordingly, applicants respectfully request withdrawal of the objection.

IV.   Objections to the Claims

Claims 1, 27, and 31 are objected to because of informalities. Specifically, claims 1 and 31 do not end with a period and claim 27 includes a period after the word "function" in line 21, but includes subsequent limitations. Applicants have amended the claims as set forth above to overcome the objections.

V.   Rejection of Claims 1-21 Under 35 U.S.C. § 101

Claims 1, 8, 16, 23, 31, and 38 are rejected under 35 § U.S.C. 101 because the claimed

App. No. 09/560,269
Amendment dated February 13, 2007
Reply to Office Action of November 13, 2006

invention is directed to non-statutory subject matter. Independent claims 1, 16 and 31 have been amended to include collecting non-redundant information relating to the execution of the application using the inserted probes. Claims 8, 23 and 38 depend from independent claims 1, 16 and 31, respectively. Accordingly, applicants request reconsideration.

VI.   Rejection of Claims 1-21 Under 35 U.S.C. § 112

Claims 1, 5, 7-15 and 31, 35, and 37-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement because the claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The Office Action states that while describing the replacement of a function call with a jump to a second called function that returns to the calling function, the specification does not describe a function call to a second called function that returns not to the calling function, but to another function. Independent claims 1, 12 and 31 recite "a jump" as more fully set forth above. Support for this amendment may be found in the specification, for example, at Figure 4. The Office Action states that the specification describes "the replacement of a function call with a jump to a second called function that returns to the calling function." (Office Action, at page 8). Thus, applicants respectfully request the rejection be withdrawn.

The Office Action also states that the specification does not provide a discussion of elimination of probe locations "when" the functions are called, i.e. at runtime. Page 13 lines 1-6 provides support for inserting probes prior to application execution. Independent claims 1, 12 and 31 have been amended to recite "eliminating the probe location at the end of the first called function and eliminating the probe location at the end of the jump to the second function *when the first called function includes a jump to the second function* and *when the second function includes a return to the calling function*." The specification provides support for eliminating probe locations when code is tail merged. (Specification at, for example, page 10 line 25 to page 11 line 26).

Claims 1, 8, 16, 23, 31, and 38 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the

steps. The Office Action states that the omitted steps are: inserting probes, and collecting information with the probes. Independent claims 1, 16 and 31 have been amended accordingly. Applications request reconsideration of the rejection.

VII.   Rejection of Claims 1-21 Under 35 U.S.C. § 103(a)

Claims 1, 10-12, 16, 25-27, 31, and 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,314,558 (hereinafter "Angel") in view of "Advanced Compiler Design and Implementation" by Muchnick (hereinafter "Muchnick"). Claims 5, 7, 13, 14, 20, 22, 28, 29, 35, 37, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Angel and Muchnick, and further in view of U.S. Patent No. 6,282,701 (hereinafter "Whygodny"), U.S. Patent No. 6,438,512 (hereinafter "Miller") and U.S. Patent No. 6,374,369 (hereinafter "O'Donnell"). Claims 8, 23, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Angel and Muchnick, and further in view U.S. Patent No. 5,761,513 (hereinafter "Yellin"). Claims 9, 15, 24, 30, 39, and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Angel, Muchnick and Yellin, and further in view of Whygodny, Miller, and O'Donnell. Applicants respectfully traverse.

Independent claim 1 has been amended to recite the following combination of elements not taught or otherwise suggested by the cited art:

A computer implemented method for collecting information relating to execution of an application *including at least one tail merged portion*, the method being executed on a computer, the method comprising:

eliminating the probe location at the end of the first called function and eliminating the probe location at the end of the jump to the second function when the first called function includes a jump to the second function and when the second function includes a return to the calling function

Applicants can find no teaching or suggesting in the cited references of instrumentation as recited in independent claim 1. There is no teaching in Angel of a computer implemented method that includes a step for eliminating the probe locations in tail merged code. In contrast, Angel teaches normal strategies of instrumenting code by using probes located at exit and entry points of a function. Angel makes no reference to any form of tail merged code. Because Angel

App. No. 09/560,269
Amendment dated February 13, 2007
Reply to Office Action of November 13, 2006

makes no reference to tail merged code, Angel cannot teach the modification to normal instrument placements strategy needed to properly instrument tail merged code.

As described in the specification, a situation in which "normal strategy of instrumenting only the entry and exit points of functions produces potentially inaccurate results occurs in what is known as a tail merge." For example, in tail merged code the sequence of calls and returns is modified from the normal sequence of calls and returns of non-tail merged code. (Specification, at page 10, line 25 to page 11, line 10). "This departure from the normal sequence of events is a potential source of ambiguity in attributing time to the correct functions." (Specification, at page 11, lies 11-12). Thus, normal instrument placement strategy may not correctly attribute time to specific functions. Thus, the normal instrumenting strategy of Angel would produce inaccurate results if applied to tail merged code.

Angel also teaches that, in order to optimize processing time not all code sections need to be instrumented. According to Angel, "[o]ne possible optimization is to *not instrument scope changes that have minimal effect on monitoring variable operations.*" (Angel, at col. 13, lines 9-11). Here, Angel teaches that portions of a program that do not have a net effect on memory usage do not need to be instrumented. (Angel, at col. 12, lines 59-64). Applicants can find no teaching of the tail merge scenario and/or the elimination of probes in tail merged code.

Applicants assert that Muchnick does not remedy the lack of teaching in Angel. Muchnick teaches a process of converting standard code into tail merged code. Muchnick makes no reference to adding probes into code. Further, Muchnick makes no reference to eliminating probes from a code. As such, neither Muchnick nor Angel teaches eliminating probe locations to alter normal probe placement strategy. In contrast, claim 1 recites "eliminating the probe location at the end of the first called function and eliminating the probe location at the end of the jump to the second function when the first called function includes a jump to the second function and when the second function includes a return to the calling function." Thus, the cited references, individually or in motivated combination, do not teach or suggest the combination of elements recited in claim 1. In making this rejection, the Office Action uses impermissible .

hindsight reasoning. The teaching of applicants' own disclosure is being used to reject the claims. Accordingly, applicants assert that independent claim 1 is allowable.

Independent claim 12 has been amended to recite the following combination of elements not taught or otherwise suggested by the cited references:

A computer readable storage medium having an application including computer executable instructions *including at least one tail merged portion*, the computer-executable instructions comprising

eliminating the probe location at the end of the first called function and eliminating the probe location at the end of the jump to the second function when the first called function includes a jump to the second function and when the second function includes a return to the calling function

As previously stated, Angel teaches normal strategies of instrumenting code by using probes located at exit and entry points of a function. Angel makes no reference to any form of tail merged code. The normal instrumenting strategy of Angel would produce inaccurate results if applied to tail merged code. Applicants assert that Muchnick does not remedy the lack of teaching in Angel because Muchnick teaches a process of converting standard code into tail merged code. Thus, the cited references, individually or in motivated combination, do not teach or suggest "eliminating the probe location at the end of the first called function and eliminating the probe location at the end of the jump to the second function when the first called function includes a jump to the second function and when the second function includes a return to the calling function." Accordingly, applicants assert that independent claim 12 is allowable.

Independent claim 16 has been amended to recite the following combination of elements not taught or otherwise suggested by the cited references:

A computer implemented method for collecting information relating to execution of an application *including at least one tail merged portion*, the method being executed on a computer, the method comprising

eliminating the probe location in the calling function at the beginning of the call to the first called function and eliminating the probe location in the calling function at the end of the call to the first called function when the first called function is an internal called function

App. No. 09/560,269
Amendment dated February 13, 2007
Reply to Office Action of November 13, 2006

As previously stated, Angel teaches normal strategies of instrumenting code by using probes located at exit and entry points of a function. Angel makes no reference to any form of tail merged code. The normal instrumenting strategy of Angel would produce inaccurate results if applied to tail merged code. Applicants assert that Muchnick does not remedy the lack of teaching in Angel because Muchnick teaches a process of converting standard code into tail merged code. Thus, the cited references, individually or in motivated combination, do not teach or suggest "eliminating the probe location in the calling function at the beginning of the call to the first called function and eliminating the probe location in the calling function at the end of the call to the first called function when the first called function is an internal called function." Accordingly, applicants assert that independent claim 16 is allowable.

Independent claim 27 has been amended to recite the following combination of elements not taught or otherwise suggested by the cited references:

A computer readable storage medium having an application including computer executable instructions *including at least one tail merged portion*, the computer-executable instructions comprising

eliminating the probe location in the calling function at the beginning of the call to the first called function and eliminating the probe location in the calling function at the end of the call to the first called function when the first called function is an internal called function

As previously stated, Angel teaches normal strategies of instrumenting code by using probes located at exit and entry points of a function. Angel makes no reference to any form of tail merged code. The normal instrumenting strategy of Angel would produce inaccurate results if applied to tail merged code. Applicants assert that Muchnick does not remedy the lack of teaching in Angel because Muchnick teaches a process of converting standard code into tail merged code. Thus, the cited references, individually or in motivated combination, do not teach or suggest "eliminating the probe location in the calling function at the beginning of the call to the first called function and eliminating the probe location in the calling function at the end of the call to the first called function when the first called function is an internal called. function." Accordingly, applicants assert that independent claim 27 is allowable.

Page 19 of 21

PAGE 22/24 * RCVD AT 2/13/2007 6:58:12 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/7 * DNIS:2738300 * CSID:206 342 6201 * DURATION (mm-ss):07-10

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Independent claim 31 has been amended to recite the following combination of elements not taught or otherwise suggested by the cited references:

A computer system comprising a processor that is arranged to execute computer executable instructions *including at least one tail merged portion*, the computer-executable instructions comprising

eliminating the probe location at the end of the first called function and eliminating the probe location at the end of the jump to the second function when the first called function includes a jump to the second function and when the second function includes a return to the calling function

As previously stated, Angel teaches normal strategies of instrumenting code by using probes located at exit and entry points of a function. Angel makes no reference to any form of tail merged code. The normal instrumenting strategy of Angel would produce inaccurate results if applied to tail merged code. Applicants assert that Muchnick does not remedy the lack of teaching in Angel because Muchnick teaches a process of converting standard code into tail merged code. Thus, the cited references, individually or in motivated combination, do not teach or suggest "eliminating the probe location at the end of the first called function and eliminating the probe location at the end of the jump to the second function when the first called function includes a jump to the second function and when the second function includes a return to the calling function." Accordingly, applicants assert that independent claim 31 is allowable.

Independent claim 42 has been amended to recite the following combination of elements not taught or otherwise suggested by the cited references:

A computer system comprising a processor that is arranged to execute computer executable instructions *including at least one tail merged portion*, the computer-executable instructions comprising

eliminating the probe location in the calling function at the beginning of the call to the first called function and eliminating the probe location in the calling function at the end of the call to the first called function when the first called function is an internal called function

As previously stated, Angel teaches normal strategies of instrumenting code by using probes located at exit and entry points of a function. Angel makes no reference to any form of

Page 20 of 21

App. No. 09/560,269
Amendment dated February 13, 2007
Reply to Office Action of November 13, 2006

tail merged code. The normal instrumenting strategy of Angel would produce inaccurate results if applied to tail merged code. Applicants assert that Muchnick does not remedy the lack of teaching in Angel because Muchnick teaches a process of converting standard code into tail merged code. Thus, the cited references, individually or in motivated combination, do not teach or suggest "eliminating the probe location in the calling function at the beginning of the call to the first called function and eliminating the probe location in the calling function at the end of the call to the first called function when the first called function is an internal called function." Accordingly, applicants assert that independent claim 42 is allowable.
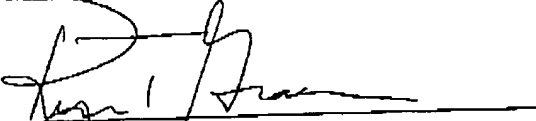
Claims 5, 7-11, 13-15, 17, 20, 22-26, 28-30, 37-41 and 43-45 include features not taught or suggested by the cited references. Moreover, those claims ultimately depend from independent claims 1, 16, and 31, respectively. As such, applicants assert that they should be found allowable for at least the same reasons as their respective independent claims.

VIII. Request For Reconsideration

In view of the foregoing amendments and remarks, all pending claims are believed to be allowable and the application is in condition for allowance. Therefore, a Notice of Allowance is respectfully requested. Should the Examiner have any further issues regarding this application, the Examiner is requested to contact the undersigned attorney for applicants at the telephone number provided below.

Respectfully submitted,

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Page 21 of 21